DOCUMENT RESUME

ED 138 355 PS 009 229

AUTHOR Lindauer, Barbara K.
TITLE The Development of Inferences About Affect.
SPONS AGENCY Public Health Service (DHEW), Washington, D.C.
PUB DATE Mar 77
GRANT HEW-PHS-HD-06864
NOTE 5p.; Paper presented at the Biennial Meeting of the Society for Research in Child Development (New Orleans, Louisiana, March 17-20, 1977)

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS Age Differences; Cognitive Development; *Comprehension; Cues; *Elementary Education; *Emotional Response; *Memory; *Recall (Psychological); Research Methodology; Social Development; *Thought Processes
IDENTIFIERS *Social Inferences

ABSTRACT

This paper describes two studies which investigated the development in elementary school children of the ability to derive inferences about the subjective states (physiological and psychological) of others. A cued recall procedure was utilized to assess the relative effectiveness of implicitly or explicitly stated emotional states as cues for sentence memory. Subjects were 128 first and fifth graders. Explicitly stated cues were more effective for the younger age groups (6-7 years) while cue types did not differ for 11-12 year olds. Also, the effect of additional information, such as the addition of a physical or temporal consequence of the action stated by the verb, was shown to facilitate performance for all age groups. A multiple choice task assessed the comprehension of the implied affect and demonstrated that although young children could choose the appropriate affect, they were not able to utilize this information effectively in the cued recall task. Results are discussed in relation to social cognitive development and to constructive comprehension processes. (Author/MS)

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Paper presented at the bienniel meeting of the Society for Research in Child Development, New Orleans, March, 1977.

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The Development of Inferences about Affect

Barbara K. Lindauer[1]

Purdue University

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Today, I would like to talk to you about some of my research on children's comprehension and memory processes. More specifically, I am interested in how children derive additional relationships or inferences when comprehending sentences. Past research has shown that for both adults and children inferences are related to improved comprehension and memory for prose like materials. It seems logical that the same inferential processes could be employed to understand social as well as non-social situations. In both types of situations, inferences can be defined as plausible relationships that can be constructed about an event or situation and that contain information not present in the situation itself.

Several studies have examined children's abilities to spontaneously construct a variety of inference types. For example, Paris and Lindauer (1976) investigated the ability of elementary school aged children to derive inferences based on implied instruments. Seven, 9 and 11-year old children were read a list of sentences that contained a common instrument such as shovel or key which was either implied or stated explicitly. In a subsequent cued recall task, children received the instrument as a retrieval cue. Young children were able to utilize this cue only if it had been overtly stated in the original sentence whereas older children were capable of recalling the sentences when the instrument was explicitly stated or only implied. Our interpretation of these results was: older children were more likely than younger children to include the inferred relationship in their memory representation. Kindergarten children, however, could be made to construct the implied relationships. When asked to simply "act out" the sentences after repeating them aloud, the children were forced to supply the necessary implied instrument at encoding. This procedure led to a higher level of recall than in the previous study and demonstrated that young children could be made to process the inference.

In a related series of studies, these results were generalized to a new class of inferences, implied consequences (Paris, Lindauer, & Cox, 1976). Again, young children could not effectively utilize cues based on consequences unless they were actually present in the sentence. Older children exhibited similar levels of recall whether the consequence was stated explicitly or implied.

The purpose of the present research was two-fold. First, I was interested in extending the previous results based on non-social types of inferences to social inferences. Research in the area of social cognition has focussed on a wide variety of inferences that can be made in moral judgement tasks, communication tasks, etc. However, there has been a consistent lack of differentiation among the types of inferences involved in these tasks and their

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This research was supported by HEW PHS HD 06864 grant to Dr. Ann Brown at the Center for the Study of Reading, Urbana, Illinois and was conducted while the author was a visiting student there. I am indebted to the students and staff at Georgetown and Mansfield, Illinois, public schools for their help and cooperation.

developmental trends. One type of inference that has been studied is children's ability to infer affective states in others. Borke (1971, 1973) has demonstrated that very young children are capable of making inferences about emotions such as happiness and sadness. Wolman, Lewis, and King (1972) have shown also that children can identify subjective states within themselves. However, they are more accurate in identifying those that have a distinct physiological component such as hunger and thirst than psychological states such as fear and anger. On the basis of this past research, I wanted to ask, "Is there a developmental trend in children's ability to derive inferences about the subjective states of others?" Second, I wanted to investigate some of the boundary conditions under which inferencing might occur. Bransford and McCarrell (1975) have shown that providing meaningful contexts for prose materials often enhances comprehension and memory. By changing or adding certain types of information to sentences concerning the subjective states of others, I hoped to facilitate social inferencing skills in young children.

The purpose of Experiment 1 was to assess children's abilities to construct spontaneously inferences about subjective states in other people. In addition, the stimuli were designed to allow for a direct comparison between the ability to derive inferences about psychological and physiological states. Also, the effect of varying contexts was investigated by adding different types of information to the sentence stimuli.

The materials consisted of two lists of eight sentences each. Eight sentences constructed according to the scheme of subject, verb, object, prepositional phrase, and an additional clause were generated to allow children to infer a plausible subjective state or affect. Four sentences described the situations involving psychological subjective states of happiness, fear, anger, and sadness, and four described the physiological states of hunger, thirst, pain, or sleepiness. Within each list, half of the subjective states were only implied in the sentences and half were explicitly stated in an additional brief sentence. The two lists differed on the type of information contained in the additional clause. One list, designated as the related list consisted of sentences containing a physical or temporal consequence of the actions of the main character. This additional information was also related to the subjective state conveyed in the sentence. In the second list, the unrelated list, the sentences contained a clause which conveyed information about the direct object and was not directly related to the subjective state. For example, a sentence from the related list was: The little girl lost her puppy in the rain and she cried all day. The affect or subjective state of sadness is implied in this example. The same sentence occuring in the unrelated list was: The little girl lost her puppy in the rain and it was brown. To make either example explicit, the additional sentence "She was sad" would be added. Each sentence appeared in both types of lists and with the affect stated explicitly and implied. Lists were balanced across grade and sex.

Sixty-four children at each of grades 1($\overline{CA}$ = 6 years,11 months) and 5($\overline{CA}$ = 11 years, 1 month) were tested individually by a female experimenter. Each child was told that the experimenter was interested in how people know what other people are feeling. They were then instructed to listen very carefully to a list of sentences read by the experimenter and to repeat each sentence aloud to help them remember the sentences. After a randomized list of 8 sentences had been read, the child was engaged in a three minute interpolated task. The children were then told that the experimenter wanted to know how many sentences they could remember. In order to help them, the experimenter explained that she

would give them clues which were related to the sentences. The experimenter also emphasized that the clue word might not have been one of the exact same words that was in the sentences, but would still remind them of one of the sentences. Cues consisted of the subjective state, such as sad, which could have been explicitly stated or only implied in the sentence. Cues were presented in the same order as the initial presentation of sentences. The experimenter scored the subjects' recall by bracketing, crossing out, or inserting words in the original sentences on a score sheet. Correct recall for each sentence required the subject to remember three of the five categories of: subject, verb, object, prepositional phrase and additional clause. In addition, the meaning of the sentence had to be preserved although paraphrase was allowed. For example, one of the sentences contained the word "monster" but several children substituted "King Kong."

The results are as follows. First graders correctly recalled 18% of the sentences where the subjective states were implied and 33% when they were explicitly stated. Fifth graders recalled 24% and 37% respectively. Preliminary analyses showed no effect of either Sex or List, or items. These factors were collapsed and a Grade x Cue x Type of Inference repeated measures ANOVA was conducted. This analysis revealed a significant Grade effect ($F_{(1,62} = 4.13$, $p < .05$), a significant Cue effect ($F_{(1,62)} = 42.53$, $p < .01$), a significant Cue x Type of Inference interaction ($F_{(1,62)} = 11.77$, $p < .01$) and a significant Grade x Cue x Type of Inference interaction ($F_{(1,62)} = 11.81$, $p < .01$). The main effects can be interpreted as follows. Fifth graders recalled more sentences than first graders. Sentences cued with explicit cues were recalled more often than sentences cued with implicit cues. Cue, either implicit or explicit, also interacted with type of inference, psychological or physiological and with grade. The locus of this triple interaction was traced to the first grader's performance. First graders recalled significantly more sentences when explicit physiological cues were employed. They remembered more implicit sentences with psychological states as cues although this difference was not significant. This suggests that the ability to spontaneously construct inferences about subjective states in others such as hunger, thirst, sleepiness, and pain are more difficult for first graders than inferences based on psychological states. Overall, there appears to be a developmental improvement in children's ability to construct social inferences such as those dealing with affect in others between the ages of 6 and 11 years.

Perhaps the difference in constructing inferences about the two types of subjective states is related to children's initial comprehension of sentences rather than a difference in actual inferencing ability. A second experiment was conducted to measure sentence comprehension by means of a forced choice task. Two lists were constructed from the sentence stimuli in Experiment 1. The lists were identical except all explicit mention of the subjective states was removed. The forced choice alternatives were the subjective states appropriate for each inference type. For example, sentences conveying psychological states had as their alternatives happiness, sadness, fear, and anger.

Sixteen first graders (CA = 6 years, 10 months) and sixteen fifth graders (CA = 10 years, 9 months) were tested by a female experimenter. The experimenter read each sentence to the child, and then had the child repeat the sentence aloud. Following each sentence, the experimenter read the four alternatives and asked the child which word went best with the sentence. The correct choice was circled on an answer sheet by the experimenter. Virtually no differences existed between the grades on this task. First graders made a total of three errors and fifth graders made only two errors. The results in Experiment 1 cannot be attributed to differences between grades in sentence comprehension. To summarize, this

research has shown that children improve in their ability to derive inferences from sentences and these results are consistent with previous research. These studies also demonstrate that children can infer subjective states in other people from verbal descriptions. The inability of first graders to generate spontaneously inferences about physiologically based states needs to be investigated further to determine if the differences between inference types are reliable.

Several questions remained unanswered by this research. Previous studies have shown that differences between cues, (ie, implicit and explicit) can be removed by changing the procedure to force processing of the inference. A similar manipulation for social inferences need to be investigated. Second, the investigation of the ability to derive social inferences has been constrained to a verbal memory and comprehension task. A more social situation, such as the viewing of films is advocated for future research. Third, additional boundary conditions other than the effects of additional information on varying sentence context should be investigated.

References

Borke, H. Interpersonal perception of young children: Egocentrism or empathy? Developmental Psychology, 1971, 5, 263-269.

Borke, H. The development of empathy in Chinese and American children between three and six years of age: A cross-culture study. Developmental Psychology, 1973, 9, 102-108.

Bransford, J. D., & McCarrell, N. S. A sketch of a cognitive approach to comprehension: Some thoughts about what it means to comprehend. In W. B. Weimer and D. S. Palermo (Eds.), Cognition and Symbolic Processes. Hillsdale, New Jersey: Erlbaum & Associates, 1975.

Paris, S. G., & Lindauer, B. K. The role of inference in children's comprehension and memory for sentences. Cognitive Psychology, 1976, 8, 217-227.

Paris, S. G., Lindauer, B. K., & Cox, G. The development of inferential comprehension. Paper presented at the Southeastern Conference on Human Development, Nashville, April 1976.

Wolman, R. N., Lewis, W. C., & King, M. The development of the language of emotions: V. Bodily referents and the experience of affect. Journal of Genetic Psychology, 1972, 121, 65-81.